

Amendments to the Claims:

Please amend the claims as follows.

1. (Previously Presented) A process for the catalytic selective oxidation of a sulfur compound contained in a hydrocarbonaceous feedstock to sulfur dioxide, wherein the process comprises: contacting a gaseous feed mixture of the hydrocarbonaceous feedstock, of which the sulfur compound is selected from the group consisting of hydrogen sulfide, mercaptans, disulfides, and heterocyclic sulfur compounds, and a molecular-oxygen containing gas with a catalyst at a temperature of at most 500 °C, wherein said catalyst consists essentially of a catalytically active group VIII noble metal selected from the group consisting of platinum, rhodium, iridium and combinations of two or more thereof at a concentration in the range of from 0.02 to 10% by weight, based on the total weight of the catalyst, supported on a catalyst carrier comprising zirconia that is stabilized or partially stabilized with yttria, wherein said feed mixture has an oxygen-to-carbon ratio of below 0.15.

2. (Original) The process of claim 1 wherein the oxygen-to-carbon ratio of the feed mixture is below 0.10.

Claims 3-8 (Canceled).

9. (Previously Presented) The process of claim 2 wherein the temperature is maintained in the range of from 200 to 500°C.

Claim 10 (Canceled).

11. (Original) The process of claim 1 wherein the feed mixture is contacted with the catalyst at a pressure in the range of from 1 to 10 bar (absolute).

12. (Original) The process of claim 11 wherein the feed mixture is contacted with the catalyst at a pressure in the range of from 1 to 5 bar (absolute).

13. (Original) The process of claim 1 wherein the feed mixture is contacted with the catalyst at ambient pressure.
14. (Original) The process of claim 1 wherein the hydrocarbonaceous feedstock is a gaseous hydrocarbonaceous feedstock.
15. (Original) The process of claim 14 wherein the hydrocarbonaceous feedstock is methane or natural gas.
16. (Original) The process of claim 14 wherein the hydrocarbonaceous feedstock comprises hydrogen sulfide in a concentration of at most 10% v/v.
17. (Original) The process of claim 16 wherein the hydrocarbonaceous feedstock comprises hydrogen sulfide in a concentration of at most 5% v/v.
18. (Original) The process of claim 15 wherein the hydrocarbonaceous feedstock comprises hydrogen sulfide in a concentration of at most 10% v/v.
19. (Original) The process of claim 18 wherein the hydrocarbonaceous feedstock comprises hydrogen sulfide in a concentration of at most 5% v/v.
20. (Original) The process of claim 1 wherein the feedstock is a liquid hydrocarbonaceous feedstock containing at most 1000 ppmw sulfur.
21. (Previously Presented) A process for the catalytic selective oxidation of hydrogen sulfide contained in a methane or natural gas feedstock to sulfur dioxide, wherein the process comprises: contacting a gaseous feed mixture of the methane or natural gas feedstock and a molecular-oxygen containing gas, wherein the gaseous feed mixture comprises up to 10% v/v hydrogen sulfide, with a catalyst at a temperature of at most 500 °C, wherein said catalyst consists essentially of a catalytically active group VIII noble metal selected from the group consisting of platinum, rhodium, iridium and combinations of two or more thereof at a concentration in the range of from 0.02 to 10% by weight, based on the total weight of the catalyst, supported on a refractory oxide

comprising zirconia that is stabilized or partially stabilized with yttria, wherein said feed mixture has an oxygen-to-carbon ratio of below 0.15.

Claims 22-23 (Canceled).

24. (Previously Presented) The process of claim 21 wherein the hydrocarbonaceous feedstock comprises hydrogen sulfide in a concentration of at most 5% v/v.

25. (Previously Presented) A process for the desulfurization of a hydrocarbonaceous feedstock, wherein the process comprises:

contacting a gaseous feed mixture of the hydrocarbonaceous feedstock, which contains a sulfur compound selected from the group consisting of hydrogen sulfide, mercaptans, disulfides, and heterocyclic sulfur compounds, and a molecular-oxygen containing gas with a catalyst at a temperature of at most 500 °C, wherein said catalyst consists essentially of a catalytically active group VIII noble metal selected from the group consisting of platinum, rhodium, iridium and combinations of two or more thereof at a concentration in the range of from 0.02 to 10% by weight, based on the total weight of the catalyst, supported on a refractory oxide catalyst carrier comprising zirconia that is partially stabilized or stabilized zirconia with yttria, wherein said gaseous feed mixture has an oxygen-to-carbon ratio of below 0.15, thereby selectively oxidizing the sulfur compounds in the hydrocarbonaceous feedstock to sulfur dioxide to provide a gaseous product containing the thus-formed sulfur dioxide; and removing the thus-formed sulfur dioxide from said gaseous product by either solvent extraction using an aqueous amine solution or an alkaline solution, or by adsorption on copper, barium or cerium oxide, or by reaction with lime.

26. (Previously Presented) The process of claim 25 wherein the oxygen-to-carbon ratio of the gaseous feed mixture is below 0.10.

Claims 27-29 (Canceled).

30. (Previously Presented) The process of claim 26 wherein the oxygen-to-carbon ratio of the gaseous feed mixture is below 0.10.

Claims 31-32 (Canceled).

33. (Original) The process of claim 25 wherein the temperature is maintained in the range of from 200 to 500°C.

34. (Original) The process of claim 25 wherein the temperature is maintained in the range of from 200 to 300°C.

35. (Previously Presented) The process of claim 25 wherein the gaseous feed mixture is contacted with the catalyst at a pressure in the range of from 1 to 10 bar (absolute).

36. (Previously Presented) The process of claim 35 wherein the gaseous feed mixture is contacted with the catalyst at a pressure in the range of from 1 to 5 bar (absolute).

37. (Previously Presented) The process of claim 25 wherein the gaseous feed mixture is contacted with the catalyst at ambient pressure.

38. (Original) The process of claim 25 wherein the hydrocarbonaceous feedstock is a gaseous hydrocarbonaceous feedstock.

39. (Original) The process of claim 38 wherein the hydrocarbonaceous feedstock is methane or natural gas.

40. (Original) The process of claim 38 wherein the hydrocarbonaceous feedstock comprises hydrogen sulfide in a concentration of at most 10% v/v.

41. (Original) The process of claim 40 wherein the hydrocarbonaceous feedstock comprises hydrogen sulfide in a concentration of at most 5% v/v.

42. (Original) The process of claim 39 wherein the hydrocarbonaceous feedstock comprises hydrogen sulfide in a concentration of at most 10% v/v.

43. (Original) The process of claim 42 wherein the hydrocarbonaceous feedstock comprises hydrogen sulfide in a concentration of at most 5% v/v.

44. (Original) The process of claim 25 wherein the feedstock is a liquid hydrocarbonaceous feedstock containing at most 1000 ppmw sulfur.

45. (Currently Amended) A process ~~as recited in claim 1, wherein said catalyst further consists essentially of~~ for the catalytic selective oxidation of a sulfur compound contained in a hydrocarbonaceous feedstock to sulfur dioxide, wherein the process comprises: contacting a gaseous feed mixture of the hydrocarbonaceous feedstock, of which the sulfur compound is selected from the group consisting of hydrogen sulfide, mercaptans, disulfides, and heterocyclic sulfur compounds, and a molecular-oxygen containing gas with a catalyst at a temperature of at most 500 °C, wherein said catalyst consists essentially of a catalytically active group VIII noble metal selected from the group consisting of platinum, rhodium, iridium, and combinations of two or more thereof at a concentration in the range of from 0.02 to 10% by weight, based on the total weight of the catalyst, zirconium and cerium supported on a catalyst carrier comprising zirconia that is stabilized or partially stabilized with yttria, wherein said feed mixture has an oxygen-to-carbon ratio of below 0.15.

46. (Currently Amended) A process ~~as recited in claim 45, wherein said catalyst carrier further comprises~~ for the catalytic selective oxidation of a sulfur compound contained in a hydrocarbonaceous feedstock to sulfur dioxide, wherein the process comprises: contacting a gaseous feed mixture of the hydrocarbonaceous feedstock, of which the sulfur compound is selected from the group consisting of hydrogen sulfide, mercaptans, disulfides, and heterocyclic sulfur compounds, and a molecular-oxygen containing gas with a catalyst at a temperature of at most 500 °C, wherein said catalyst consists essentially of a catalytically active group VIII noble metal selected from the group consisting of platinum, rhodium, iridium, and combinations of two or more thereof at a concentration in the range of from 0.02 to 10% by weight, based on the total weight of the catalyst, supported on a catalyst carrier comprising a non-refractory oxide bulk material.

47. (Previously Presented) A process as recited in claim 46, wherein the temperature is maintained in the range of from 200 to 500 °C; the feed mixture is contacted with the catalyst at a pressure in the range of from 1 to 5 bar (absolute).

48. (Currently Amended) A process ~~as recited in claim 21, wherein said catalyst further consists essentially of~~ for the catalytic selective oxidation of hydrogen sulfide contained in a methane or natural gas feedstock to sulfur dioxide, wherein the process comprises: contacting a gaseous feed mixture of the methane or natural gas feedstock and a molecular-oxygen containing gas, wherein the gaseous feed mixture comprises up to 10% v/v hydrogen sulfide, with a catalyst at a temperature of at most 500 °C, wherein said catalyst consists essentially of a catalytically active group VIII noble metal selected from the group consisting of platinum, rhodium, iridium and combinations of two or more thereof at a concentration in the range of from 0.02 to 10% by weight, based on the total weight of the catalyst, zirconium and cerium supported on a refractory oxide comprising zirconia that is stabilized or partially stabilized with yttria, wherein said feed mixture has an oxygen-to-carbon ratio of below 0.15.

49. (Currently Amended) A process ~~as recited in claim 48, wherein said catalyst carrier further comprises~~ for the catalytic selective oxidation of hydrogen sulfide contained in a methane or natural gas feedstock to sulfur dioxide, wherein the process comprises: contacting a gaseous feed mixture of the methane or natural gas feedstock and a molecular-oxygen containing gas, wherein the gaseous feed mixture comprises up to 10% v/v hydrogen sulfide, with a catalyst at a temperature of at most 500 °C, wherein said catalyst consists essentially of a catalytically active group VIII noble metal selected from the group consisting of platinum, rhodium, iridium and combinations of two or more thereof at a concentration in the range of from 0.02 to 10% by weight, based on the total weight of the catalyst, supported on catalyst carrier comprising a non-refractory oxide bulk material.

50. (Previously Presented) A process as recited in claim 49, wherein the temperature is maintained in the range of from 200 to 500 °C; the feed mixture is contacted with the catalyst at a pressure in the range of from 1 to 5 bar (absolute).

51. (Currently Amended) A process ~~as recited in claim 25, wherein said catalyst further consists essentially of~~ for the desulfurization of a hydrocarbonaceous feedstock, wherein the process comprises:  
contacting a gaseous feed mixture of the hydrocarbonaceous feedstock, which contains a sulfur compound selected from the group consisting of hydrogen sulfide, mercaptans, disulfides, and heterocyclic sulfur compounds, and a molecular-oxygen containing gas with a catalyst at a temperature of at most 500 °C, wherein said catalyst consists essentially of a catalytically active group VIII noble metal selected from the group consisting of platinum, rhodium, iridium and combinations of two or more thereof at a concentration in the range of from 0.02 to 10% by weight, based on the total weight of the catalyst, zirconium and cerium supported on a refractory oxide catalyst carrier comprising zirconia that is partially stabilized or stabilized zirconia with yttria, wherein said gaseous feed mixture has an oxygen-to-carbon ratio of below 0.15, thereby selectively oxidizing the sulfur compound in the hydrocarbonaceous feedstock to sulfur dioxide to provide a gaseous product containing the thus-formed sulfur dioxide; and removing the thus-formed sulfur dioxide from said gaseous product by either solvent extraction using an aqueous amine solution or an alkaline solution, or by adsorption on copper, barium or cerium oxide, or by reaction with lime.

52. (Currently Amended) A process ~~as recited in claim 51, wherein said catalyst carrier further comprises a~~ for the desulfurization of a hydrocarbonaceous feedstock, wherein the process comprises:  
contacting a gaseous feed mixture of the hydrocarbonaceous feedstock, which contains a sulfur compound selected from the group consisting of hydrogen sulfide, mercaptans, disulfides, and heterocyclic sulfur compounds, and a molecular-oxygen containing gas with a catalyst at a temperature of at most 500 °C, wherein said catalyst consists essentially of a catalytically active group VIII noble metal selected from the group consisting of platinum, rhodium, iridium and combinations of two or more thereof at a concentration in the range of from 0.02 to 10% by weight, based on the total weight of the catalyst, supported on a catalyst carrier comprising a non-refractory oxide bulk material, wherein said gaseous feed mixture has an oxygen-to-carbon ratio of below 0.15, thereby selectively oxidizing the sulfur compound in the hydrocarbonaceous feedstock to sulfur dioxide to provide a gaseous product containing the thus-formed sulfur dioxide; and removing the thus-formed sulfur dioxide from said gaseous product by either

solvent extraction using an aqueous amine solution or an alkaline solution, or by adsorption on copper, barium or cerium oxide, or by reaction with lime.

53. (Previously Presented) A process as recited in claim 52, wherein the temperature is maintained in the range of from 200 to 500 °C; the feed mixture is contacted with the catalyst at a pressure in the range of from 1 to 5 bar (absolute).

54. (Previously Presented) A catalyst composition useful in the selective oxidation of a sulfur compound contained in a hydrocarbonaceous feedstock, wherein said catalyst composition comprises: a particle comprising zirconia that is stabilized or partially stabilized with yttria, wherein said particle having incorporated therein cerium and rhodium.

55. (Previously Presented) A catalyst composition as recited in claim 54, wherein the rhodium is present in said catalyst composition at a concentration in the range of from 0.02 to 10 % by weight, based on the total weight of said catalyst composition.

56. (Previously Presented) A catalyst composition as recited in claim 55, wherein said particle further has incorporated therein iridium in an amount such that said catalyst composition has a concentration of said iridium in the range of from 0.02 to 10 % by weight, based on the total weight of said catalyst composition.

57. (Previously Presented) A catalyst composition as recited in claim 56, wherein said particle has been coated with zirconia paint before the incorporation therein of the cerium, or rhodium, or iridium, or any combination thereof.

58. (Previously Presented) A catalyst composition as recited in claim 57, wherein said catalyst composition has been dried or calcined, or both.

59. (Previously Presented) A catalyst composition as recited in claim 58, wherein said particle further comprises a non-refractory oxide bulk material.



60. (Previously Presented) A catalyst composition useful in the selective oxidation of a sulfur compound contained in a hydrocarbonaceous feedstock, wherein said catalyst composition consists essentially of: a particle comprising zirconia that is stabilized or partially stabilized with yttria, and metal selected from the group consisting of rhodium, iridium, cerium and combinations thereof.
61. (Previously Presented) A catalyst composition as recited in claim 60, wherein said catalyst composition further consists essentially of rhodium present in said catalyst composition at a concentration in the range of from 0.02 to 10 % by weight, based on the total weight of said catalyst composition.
62. (Previously Presented) A catalyst composition as recited in claim 61, wherein said catalyst composition further consists essentially of iridium present in said catalyst composition at a concentration in the range of from 0.02 to 10 % by weight, based on the total weight of said catalyst composition.
63. (Previously Presented) A catalyst composition as recited in claim 62, wherein said catalyst composition further consists essentially of cerium.
64. (Previously Presented) A catalyst composition as recited in claim 63, wherein said catalyst composition has been dried or calcined, or both.
65. (New) A process as recited in claim 45, wherein said catalyst further consists essentially of a performance-enhancing inorganic metal cation selected from Al, Mg, Zr, Ti, La, Hf, Si, Ba, and Ce.
66. (New) A process as recited in claim 65, wherein said concentration of said catalytically active group VIII noble metal is in the range of from 0.1 to 5% by weight.
67. (New) A process as recited in claim 66, wherein said temperature is maintained in the range of from 200 °C to 500 °C.

68. (New) A process as recited in claim 67, wherein said temperature is maintained in the range of from 200 °C, to 300 °C.

69. (New) A process as recited in claim 68, wherein said oxygen-to-carbon ratio of said feed mixture is below 0.10.

70. (new) A process as recited in claim 47, wherein said non-refractory oxide bulk material is selected from a group of materials consisting of Fe, Cr and Al containing alloy with an alumina or zirconia surface layer.

71. (New) A process as recited in claim 70, wherein said concentration of said catalytically active group VIII noble metal is in the range of from 0.1 to 5% by weight.

72. (New) A process as recited in claim 71, wherein said temperature is maintained in the range of from 200 °C to 500 °C.

73. (New) A process as recited in claim 72, wherein said temperature is maintained in the range of from 200 °C to 300 °C.

74. (New) A process as recited in claim 73, wherein said oxygen-to-carbon ratio of said feed mixture is below 0.10.

75. (New) A process as recited in claim 48, wherein said catalyst further consists essentially of a performance-enhancing inorganic metal cation selected from Al, Mg, Zr, Ti, La, Hf, Si, Ba, and Ce.

76. (New) A process as recited in claim 75, wherein said concentration of said catalytically active group VIII noble metal is in the range of from 0.1 to 5% by weight.

77. (New) A process as recited in claim 76, wherein said temperature is maintained in the range of from 200 °C to 500 °C.

78. (New) A process as recited in claim 77, wherein said temperature is maintained in the range of from 200 °C to 300 °C.

79. (New) A process as recited in claim 78, wherein said oxygen-to-carbon ratio of said feed mixture is below 0.10.

80. (new) A process as recited in claim 50, wherein said non-refractory oxide bulk material is selected from a group of materials consisting of Fe, Cr and Al containing alloy with an alumina or zirconia surface layer.

81. (New) A process as recited in claim 80, wherein said concentration of said catalytically active group VIII noble metal is in the range of from 0.1 to 5% by weight.

82. (New) A process as recited in claim 81, wherein said temperature is maintained in the range of from 200 °C to 500 °C.

83. (New) A process as recited in claim 82, wherein said temperature is maintained in the range of from 200 °C to 300 °C.

84. (New) A process as recited in claim 83, wherein said oxygen-to-carbon ratio of said feed mixture is below 0.10.

85. (New) A process as recited in claim 51, wherein said catalyst further consists essentially of a performance-enhancing inorganic metal cation selected from Al, Mg, Zr, Ti, La, Hf, Si, Ba, and Ce.

86. (New) A process as recited in claim 85, wherein said concentration of said catalytically active group VIII noble metal is in the range of from 0.1 to 5% by weight.

87. (New) A process as recited in claim 86, wherein said temperature is maintained in the range of from 200 °C to 500 °C.

88. (New) A process as recited in claim 87, wherein said temperature is maintained in the range of from 200 °C to 300 °C.

89. (New) A process as recited in claim 88, wherein said oxygen-to-carbon ratio of said feed mixture is below 0.10.

90. (new) A process as recited in claim 53, wherein said non-refractory oxide bulk material is selected from a group of materials consisting of Fe, Cr and Al containing alloy with an alumina or zirconia surface layer.

91. (New) A process as recited in claim 90, wherein said concentration of said catalytically active group VIII noble metal is in the range of from 0.1 to 5% by weight.

92. (New) A process as recited in claim 91, wherein said temperature is maintained in the range of from 200 °C to 500 °C.

93. (New) A process as recited in claim 92, wherein said temperature is maintained in the range of from 200 °C to 300 °C.

94. (New) A process as recited in claim 93, wherein said oxygen-to-carbon ratio of said feed mixture is below 0.10.